Notes.

Important changes are announced at the Ministry of Agriculture, the effect of which is the promotion of Mr. F. C. L. Floud to be Permanent Secretary and the liberation of Sir Daniel Hall from office work so that he will be able to keep in close personal touch with agricultural developments in this country as well as abroad, and devote his whole time to the organisation of agricultural education and research. Sir Daniel has been associated with this work throughout his whole official career. The scheme now in operation comprises four essential parts:—(1) Research institutions, where knowledge is gained and agricultural science systematically developed and put into such form that teachers and experts can use it. At first this work was distributed among a number of university departments, but of recent years there has been a tendency to concentrate it at a few institutions owing to the necessity for bringing individual workers into closer personal contact with each other and with the large-scale problems of the farmer. (2) Agricultural colleges, where experts and large farmers will be trained, receiving a three years' course of instruction of university character. Most of these colleges are associated with universities which award degrees in agriculture; for students who do not wish to take degrees there is a diploma course requiring a high standard of technical work. (3) Farm institutes for small farmers and farm-workers who cannot spare three years for college, but have some practical knowledge and are unable or unwilling to go through the ordinary college course. These institutes aim at giving sound courses of instruction on soil, manure, crops, animal husbandry, etc., but it is usually presumed that the student will take up farming in the area served by the institution, and for which the instruction is specially appropriate. (4) Advisory officers. In each county arrangements are made whereby farmers, smallholders, and others may consult the agricultural expert appointed by the county authority in regard to any difficulties they may meet with in their work. The expert is in a position somewhat similar to that of the general medical practitioner, and usually finds that he can deal with a large number of the cases presented to him. He is, however, in touch with the colleges, research institutions, etc., and can always obtain expert advice in any particular problem of special difficulty.

Prof. T. H. Pear has been elected an honorary secretary of the Manchester Literary and Philosophical Society in succession to Prof. C. A. Edwards.

Mr. J. A. Brodie will deliver an inaugural address at the opening meeting of the one hundred and second session of the Institution of Civil Engineers on Tuesday, November 2, at 5.30 p.m

The *British Medical Journal* announces that the fourth congress of the Far Eastern Association of Tropical Medicine will be held in August, 1921, at Batavia, the capital of the Dutch East Indies, under the presidency of Dr. W. T. de Vogel.

The University and the Royal Academy of Sciences of Bologna will hold a joint commemoration service for the late Prof. Righi in the lecture hall of the University on November 1. This will be the fortieth anniversary of Righi's first association with the University, and an oration will be delivered by Prof. Luigi Donati, director of the Royal School of Engineering.

A joint meeting organised by the Faraday Society and the Sheffield Section of the Institute of Metals will be held at the University of Sheffield on Friday, November 19, to discuss papers dealing with various aspects of electro-plating. Communications are promised from representatives of the scientific side of the electro-plating industry in London, Birmingham, and Sheffield Anyone desirous of taking part is invited to communicate with the Sheffield local hon. secretary of the Faraday Society, Dr. F. C. Thompson, Department of Applied Science, University of Sheffield.

We learn from the *British Medical Journal* that, through the gift of an anonymous fellow, the Royal Society of Medicine has been able to institute a triennial gold medal open to medical practitioners throughout the world. Sir Almroth Wright has been chosen as the first medallist, and the presentation will be made to him by the president of the society, Sir John Bland-Sutton, at 5 p.m., on Thursday, November 11, at 1 Wimpole Street, and Sir Almroth Wright will afterwards give an address on medical research.

At the annual meeting of the Royal Society of Edinburgh, held on October 25, the following were elected as office-bearers and members of council:—*President:* Prof. F. O. Bower. *Vice-Presidents:* Prof. D. Noël Paton, Prof. A. Robinson, Sir G. A. Berry, Prof. W. Peddie, Sir J. A. Ewing, and Prof. J. W. Gregory. *General Secretary:* Dr. C. G. Knott. *Secretaries to Ordinary Meetings:* Prof. E. T. Whittaker and Prof. J. H. Ashworth. *Treasurer:* Dr. J. Currie. *Curator of Library and Museum:* Dr. A. Crichton Mitchell. *Councillors:* Prof. R. A. Sampson, Prof. J. Lorrain Smith, Dr. W. A. Tait, Surg.-Gen. W. B. Bannerman, Mr. H. M. Cadell, Prof. A. R. Cushny, Prof. F. G. Baily, Mr. G. J. Lidstone, Dr. R. Campbell, Prof. J. C. Irvine, the Hon. Lord Salvesen, and Prof. J. A. Thomson.

We referred in our issue of September 2, p. 26, to a statement received from a correspondent in India that Sir Alfred Bourne was to be succeeded in the directorship of the Indian Institute of Science, Bangalore, by an administrator with no scientific experience, and we remarked that such an appointment would be greatly deprecated by scientific workers. By the statutes of the institute, the council appoints a committee at home to make nominations, and from the nominations sent out it selects a name for the approval of the Viceroy, who is patron of the institute. If the council sent home a nomination for the office, it apparently went beyond the spirit of the statutes, but, in any event, we understand that no director has yet been appointed to succeed Sir Alfred Bourne. We trust that the post will be filled by a man who combines administrative capacity with scientific knowledge.

ONE of the most valuable contributions to the study of magic in the Malay Peninsula was the description by Mr. W. W. Skeat in his "Malay Magic" of the methods by which the soul of the rice plant was evoked in the seed grain. Our knowledge of these practices has recently been advanced by the papers contributed by Mr. R. O. Winstedt to the *Journal of the Federated States Museums* (vol. ix., part 2, July, 1920) descriptive of similar rites in Upper Perak and Negri Sembilan. In the former region the seed is washed and cleansed with limes, and the farmer makes the invocation: "Greetings be to thee, God's prophet Solomon, King of all the earth! I would sow seed rice. I pray thee, cherish it from all danger and hazard!" At harvest he says: "Greetings be to you, gnomes of the latter days, gnomes of the beginning, gnomes one hundred and ninety! Get ye back and aside! If ye turn not aside, I will curse you!" After the regular invocation the soul of the rice will come in the form of a grasshopper or other insect with the sound of a breeze. When the rice-soul is invoked at harvest the magician must wave a white cloth, so that the rice-soul shall not fall on and crush one of the party at her coming. This valuable contribution supplies additional information on the subject fully discussed by Sir James Frazer in the last edition of his "Golden Bough."

THE origin of cancer is discussed by Dr. Alexander Paine in a paper in the *Lancet* of October 2 last (p. 693). The conclusion Dr. Paine arrives at is that cancer is due, not to the action of a specific parasite, as has been suggested, but to a disordered growth of epithelium caused by various chemical or physical irritants, the most important being the toxins or poisons of micro-organisms. Dr. Paine considers that the origin of cancer lies in the degeneration of the "nobler" parts of the cell consequent on damage to its structure. The result of this damage is to disturb the balance of metabolism by impairing the special functions of the cell, thereby causing persistent overgrowth.

THE Research Defence Society has published a pamphlet by Sir Leonard Rogers on "The Value of Experiments on Animals." No one is better qualified than Sir Leonard Rogers to speak with authority on this subject. Investigations on rinderpest in cattle and surra in horses are quoted as examples of the value of animal experiments in the elucidation and prevention of diseases affecting the lower animals, whereby much suffering to the animals themselves and pecuniary loss to their owners are diminished. The action of snake-venoms and the preparation of curative sera for snake-bites, the use of permanganates in the treatment of snake-bite and of cholera, work on the dysenteries, and experiments leading to improved treatments of leprosy, tuberculosis, and kala-azar are all summarised. It is shown how much we are indebted to experiments on animals for a better knowledge of these conditions and for improved methods of dealing with them.

MR. E. H. TAYLOR gives (*Philippine Journ. Sci.*, vol. xvi., No. 3, March, 1920) an account of sixty-six species—seventeen being new—of Philippine Amphibia. These belong to the orders Apoda—represented by a new species of Ichthyophis—and Salientia, there being only one doubtful record in the order Caudata. The Salientia, which includes the frogs and toads, is represented by four families, Ranidæ, Engystomidæ, Bufonidæ, and Pelobatidæ, the first of which has by far the largest representation. A new genus of the Ranidæ—Hazelia—is described.

MESSRS. BOVING AND CHAMPLAIN (Proceedings of the U.S. National Museum, vol. lvii., No. 2323, 1920) describe the morphology and taxonomy of a number of North American species of beetle larvæ belonging to the family Cleridæ. With very few exceptions, these insects, both as larvæ and adults, prey upon destructive wood- and bark-boring beetles. This careful and very exact memoir should appeal to all coleopterists, and the classification of Clerid larvæ illustrates how much a taxonomic arrangement of the beetles can differ from that of their larvæ. A new appropriate classification of larvæ independent of the adults is necessary in this case. The second part of the paper deals with the biology and seasonal history of the Cleridæ. Information of this nature is obviously essential if the forester is ever to benefit by the preservation of the predators, and at the same time by the destruction of the injurious species upon which they prey. The authors state that, whenever practicable, the dissemination of Cleridæ, particularly of Thanasimus and Enoclerus, in quantities in badly infested regions would be a valuable additional aid to control measures.

A CERTAIN amount of romance is attached to the control of insect pests by parasites, and the Americans have specialised in this work. Those interested will find a very full illustrated account of the subject in the Monthly Bulletin of the Department of Agriculture for California (vol. ix., No. 4, April, 1920). Several parasites have been introduced as natural enemies of mealy-bugs in the hope that some might prove effective. One, a so-called mealy-bug destroyer, *Cryptolaemus Montrouzieri*, Muls., a ladybird beetle from Australia, was expected to solve the problem, but after the first few months seemed to die out except in particular localities. The reason is fairly obvious. The success of such a parasite means that its natural food becomes scarce, and therefore it starves. The problem has now, however, been solved by the Californian authorities, who found that they could feed the mealy-bug on potato-sprouts, and hence were enabled to keep the ladybird fed and breeding during the winter months. Special insectaries have been built for this purpose, and tubes of the ladybird can be supplied for release when and where necessary the following spring.

MANY entomologists will welcome an important paper by Mr. A. C. Baker on the classification of Aphidæ which has been issued lately as Bulletin No. 826 of the U.S. Bureau of Entomology. Probably no group of insects has received more attention from the economic point of view than aphides or plant-lice. Unfortunately, the classification and synonymy of aphides are in a chaotic condition, and great difficulty is often experienced in securing correct naming of specimens. Mr. Baker's paper deals with their generic classification, and was undertaken with the object of remedying this defect, to some extent at least. He regards these insects as constituting the superfamily Aphidoidea, and his efforts are confined to the genera and tribes of the family Aphididæ; Phylloxera and its allies he considers to be a separate family. The genus Mindarus is regarded in some respects as the most primitive of all forms, while the Hormaphidini are considered to be the most specialised. The last-named insects are gall-formers; they lack the cornicles or honey-tubes, and have curious aleyrodiform generations. The systematist who desires to make real progress with the specific determination of many aphides will have to rear each individual species and note carefully the characters of each generation for a given food-plant. The labour involved would be great and the time demanded lengthy, but the progress made would be sure, and substantial biological knowledge would result.

THE problem of the toxic action of sulphur used as a fungicide is being investigated at the Agricultural and Horticultural Research Station, Long Ashton, Bristol, and a preliminary report on the subject by Messrs. B. T. P. Barker, C. T. Gimingham, and S. P. Wiltshire appears in the station's annual report for 1919, recently received. It has frequently been noticed that flowers of sulphur applied in paste form to the hot-water pipes in greenhouses will keep in check diseases of the mildew type on plants in the houses. Further, there are records of cases of unsprayed gooseberry bushes which have been defoliated as a result of the lime-sulphur spraying of adjacent plots of bushes. The results suggest that the toxicity of the spray is due to some gaseous compound, and if such a compound could be discovered it might be possible to surround plants with an atmosphere sufficiently antiseptic to prevent disease. The nature of the changes which follow the application of a sulphur spray were, therefore, studied, and the results showed that the active agent is the finely divided sulphur which is formed by the decomposition of the spray fluid. Several theories have been advanced to explain the action of this sulphur; the toxicity may be due to the gradual oxidation of the sulphur to sulphur dioxide, to the formation of sulphuretted hydrogen, to conversion into sulphuric acid, or, finally, the sulphur may act of itself by its own vapour. The experiments at Long Ashton show that under ordinary practical conditions none of these hypotheses meet the case. Further experiments have been made, and it is hoped that these will demonstrate the method by which sulphur at a distance from the plants under treatment is brought into contact with the fungus. It then remains to discover what happens when the sulphur comes into contact with the fungus, and for this purpose further researches must be made.

PROF. JEAN MASSART records (Bull. Acad. Roy. Belgique, Classe des Sciences, 1920, Nos. 4–5) the results of his observations on the movement of different species of littoral flagellates, and gives numerous figures of the organisms and of their paths of movement. Several of the genera and species observed are new, but the systematic descriptions will be published later. In Podomastix (a new genus) the pseudopodia—one to four in number—are long and slender, uniform in thickness, sometimes branched, and movable in an oar-like manner. They are retractile, and represent a transition between pseudopodia and flagella. The two flagella of *Cercobodo primitiva*, n.sp., are tapering prolongations of pseudopodia, but, contrary to those of Podomastix, they are permanent. One of the flagella is anterior and serves for swimming, the other is directed posteriorly. This organism can also move forward by lashing its anterior flagellum, its posterior flagellum and part of its body being applied to some object over which it is progressing, and, finally, it can move in amœboid fashion. The author remarks that many of the flagellates exhibit these three kinds of locomotion. *Clautriavia mobilis*, which has a single flagellum directed backwards, never swims freely; it becomes applied to some object by the flagellum, and pushes itself forwards obliquely, first right, then left. Dimastigamœba, n.g., forms pseudopodia while swimming freely and while creeping. In the latter condition the two flagella trail behind. The reaction —acid or alkaline—of the surrounding fluid was found to play an important part in determining change of form with Eugleninæ. In a slightly acid fluid these organisms swim in a state of extension and without modifying their contour, but if the medium is rendered alkaline the swimming is arrested and the organisms exhibit diverse changes of form.

THE latest issue of the Journal of the Marine Biological Association (No. 2, vol. xii.) contains several papers dealing in considerable detail with the life-histories and food of Teleostean fishes. Particularly noticeable is a paper (promising further contributions to the subject) on the physical conditions influencing breeding in marine organisms, breeding being defined as "fertilisation resulting in subsequent development." There is much experimental and observational work in the literature of biology, and Dr. Orton collates and discusses some of this. The breeding of a marine animal is usually seasonal, and may occur during a very limited part of the year, or it may be continuous (in some tropical and abyssal organisms). It may begin at a very early period in the life of an animal, be repeated annually, or even be delayed until almost the end of life, and may occur only once. It is very difficult to correlate the nature and abundance of food with the occurrence and duration of the breeding period, and Dr. Orton inclines to disregard this factor, assigning little or no significance to it. Salinity variations may be so capricious in relation to the distribution and habits of some animals that these, too, are difficult to correlate with spawning cycles. On the other hand, temperature variations seem to explain many facts, and the discussion deals largely with these changes. There is a temperature constant which applies to most marine species, and breeding proceeds when this condition is satisfied. Growth (and absolute dimensions) will depend to some extent upon the fraction of the lifetime of the animal occupied in breeding. One might therefore expect that a semi-sedentary or sedentary animal at the extreme northerly limit of its distribution would be generally larger than one in which the temperature of the sea remained near the constant expressing the temperature optimum. It is suggested that the approximately uniform conditions obtaining in some polar, tropical, and abyssal marine areas may be connected with prolonged, or even continuous, breeding periods. The geographical distribution of a marine animal is obviously controlled by its physiological temperature constant, and deviations from the latter may be the mode of origin of sub-species or varieties.

AMONG a number of water-supply papers issued by the United States Geological Survey special attention may be directed to several series of river plans and profiles constructed in order to determine the location of undeveloped water powers. Recent volumes include "Profile Surveys of Rivers in Wisconsin" (Paper 417), "Profile Surveys of Skagit River Basin, Washington" (Paper 419), and "Profile Surveys along the Rio Grande, Pecos River, and Mora River, New Mexico" (Paper 421). The maps show the outlines of the river-banks, islands, the position of rapids, falls, shoals, and existing dams, and the crossings of all ferries and roads, in addition to the contours of the banks to an elevation high enough to indicate the possibility of using the streams. Data concerning the volume of the flow have been published in previous papers.

THE Monthly Bulletin of the Weather Bureau of the Manila Central Observatory issued by the Government of the Philippine Islands contains detailed observations for numerous stations situated in different parts of the group. The monthly results for August, 1919, are to hand, prepared under the direction of the Rev. José Algué, S.J. Rainfall at Manila during the month was 78·10 in., which breaks all records since the foundation of the observatory in 1865; the previous highest rainfall in August was 43·15 in. in 1877, and the highest for any month of the year was 57·88 in. in September, 1867.

THE exact relations between climate and the growth of crops, and the possibilities of accurate forecasts of production, is the subject of an article by Mr. T. A. Blair in the *Scientific Monthly* for October. Mr. Blair shows in the case of maize in Ohio that the United States Weather Bureau has found that a July rainfall of less than 3 in. means an average yield of 30 bushels per acre, and that a rainfall of 5 in. or more results in 38 bushels. When the July rainfall is 3¼ in. the yield is 15,000,000 bushels greater than when it falls short of that amount by half an inch. In the four great maize-growing States of Indiana, Illinois, Iowa, and Missouri the addition of half an inch to a total of 2¾ in. adds 10 bushels per acre to the average yield. A more precise relationship is found in the idea of critical period—that is, certain short periods of time in the growth of any crop, during which its future prospects are largely determined. With some crops this is a single period; with some temperature, and with others rainfall or sunshine, are the most important factors. In the case of maize in Ohio it has been found that the first ten days of August are the critical period as regards rainfall. The application of this knowledge may be used to increase production in two ways. First, it will be possible to determine what crops are climatically suited to a particular district; and, secondly, by the use of early or late varieties and by the help of fertilisers or other means, the crop may be advanced or retarded so as to bring the critical period into coincidence with favourable weather.

Science Progress for October contains an article by Dr. Aston which summaries his work on the atomic weights of the elements as determined by his method of the "mass spectra." These spectra are obtained on a photographic plate placed *in vacuo* by deflecting positive rays on to it by passing them first through an electric, then through a magnetic, field in such a way that all the rays corresponding to an element of given mass are concentrated in a short line on the plate and those of different masses in other parallel lines. The separation of the lines is sufficient to fix the atomic weights to considerably less than a tenth of a unit. By this method it has been possible to demonstrate that boron consists of two, neon, silicon, and chlorine of two or three, bromine of two, krypton of six, and mercury of at least two isotopes—that is, elements of the same chemical properties but of different atomic weights. Dr. Aston concludes that the atoms have weights which are all integral numbers, and that observed fractional atomic weights are due to mixtures of two or more isotopes.

ELECTRIC furnaces in which the heating element consists of a metallic wire or strip are now extensively used both in the workshop and in the laboratory, and possess the advantages of cleanliness, accuracy of temperature control, and small working costs. A special form, possessing several new and useful features, and intended mainly for workshop use, is announced by Automatic and Electric Furnaces, Ltd. The furnace-chamber or muffle is flat on the top and bottom, while the sides are rounded, this shape being specially suited to secure complete contact with the heating coil wound on its exterior. In order to prevent destruction of the coil through inadvertent overheating, a cut-out consisting of a loop of wire melting at 960° C. is inserted in the furnace. The heating current passes through the loop and is cut off by the melting of the latter, a red pilot-lamp being simultaneously lit up to serve as a warning. Several sizes are listed, ranging in power consumption from 700 to 9500 watts. The muffles are made of a new refractory material called "Ameroid," which is claimed to possess special advantages. We would suggest that intending purchasers of furnaces would prefer to know the composition of the refractory—to which the name given furnishes no clue—so as to judge of its suitability to their requirements.

Engineering for October 15 contains a description of a new $7\frac{1}{2}$-ton six-wheel commercial vehicle made by Messrs. G. Scammell and Nephew, London. One obvious way of reducing costs of road transport is to increase the weight of the load which can be handled by one vehicle and one road crew, and this lorry appears to fulfil this condition admirably. It consists of a four-wheel chassis carrying the engine, and is arranged to draw a two-wheel body which pivots on a turntable at the rear of the chassis. The weight of the complete vehicle is $4\frac{1}{2}$ tons, and it can carry a load of $7\frac{1}{2}$ tons without exceeding an axle-load of 6 tons, which is the limit allowable for a vehicle travelling at 12 miles per hour. The vehicle is able, in addition, to draw a 6-ton trailer, so that a useful load of $13\frac{1}{2}$ tons can be dealt with. Whilst the vehicle is not the first six-wheeler which has been produced, it possesses many points of novelty and interest which add to its usefulness and efficiency. The engine develops 47 brake-horse-power at 1000 revolutimes per minute.

The presidential address to Section H (Anthropology) of the British Association, which was delivered by Prof. Karl Pearson at Cardiff in August last, has been re-issued as a separate publication by the Cambridge University Press, price 1*s.* 6*d.*

Our Astronomical Column.

Brilliant Meteor of October 19.—This fine object was observed at 8.15 G.M.T., and descriptions of its appearance have been received by Mr. Denning from Purley and Oxted, in Surrey, and from Stowmarket. Fortunately, the meteor was seen by two experienced observers, Miss A. Grace Cook and Mr. J. Edmund Clark. It was brighter than Venus and gave an intense flash, although the half-illuminated moon was in the same quarter of the sky. The motion was moderate, and a streak remained along one section of the path for about 10 seconds.

On the same date as that on which the meteor appeared the shower of Orionids is usually abundant, and the fireball from its direction of flight seems to have been a brilliant member of that system, though the radiant point was a few degrees below the horizon.

If we adopt a radiant at 88°+17°, the observations of the object indicate a height from about 61 to 69 miles along a path of 110 miles, and a velocity of about 35 miles per second. In fact, the meteor seems to have been rising in the atmosphere instead of falling, as is usually the case.

The luminous flight occurred over the English Channel, from close to Beachy Head to about 40 miles south of Bournemouth.

Over the West of England the sky was cloudy, and it is important that further accounts should be sent to Mr. Denning from the eastern counties, as the computed heights are rather exceptional and require further investigation.

The Total Solar Eclipse of September, 1922.—The track of totality in this eclipse traverses the Maldive Archipelago and Christmas Island, south of Java. It then passes right across Australia, but reasonably accessible stations are confined to the eastern portion of its track. Mr. H. A. Hunt, the Commonwealth Meteorologist, acting under instructions from his Government, has prepared a map giving much meteorological information.

A shaded area runs across Australia parallel to, but somewhat south of, the eclipse track; it is stated that this shaded region has no single well-marked wet season, but is subject to both summer and winter rain-producing influences. The map also shows the periods in which most rain falls in each region, and it is noteworthy that the month of September occurs in the wet season on the south coast only, so that the month appears to be favourable on the eclipse track. The sun's altitude on the east coast of Queensland is only 18°, but 26° may be obtained by proceeding inland by rail to Cunnamulla or Coongoola. The directors of the leading Australian observatories have expressed their hope of occupying stations in Queensland, while plans are being formed for expeditions from England to the Maldives and Christmas Island. The scheme of observations will include further verification of the gravitational deflection of light, as it is desirable to strengthen the evidence for a result of such fundamental importance.

The Capture of Comets by Planets.—Prof. H. N. Russell contributes a second article on this subject to *Astr. Journ.*, No. 775. He shows that out of a hundred million comets that approach within an astronomical unit of the sun, 90,000 would be made periodic by Jupiter's action and 2400 by that of Saturn, while the numbers in the case of Uranus and Neptune are only 14 and 8 respectively. Hence he concludes that the two outermost planets have not played any part in such capture, with the possible exception of the comet of the November meteors by Uranus. Prof. Russell admits the curious relationship of the orbits of the comets with periods less than a century, which fall into four groups, the aphelia of which are somewhat outside the orbits of the giant planets. This point gives strong grounds for assuming some connection between these cometary groups and the corresponding planets; further, the point made by Prof. Russell, that many of the cometary orbits considered do not pass within several astronomical units of the planet with which they are associated, may be explained by the slow alteration in the cometary orbit through planetary perturbations.

Many of the facts now pointed out were noted by Mr. R. A. Proctor half a century ago. His explanation was that the origin of the comets in question took place, not by capture, but by expulsion from the giant planets. It is surprising that this suggestion has met with so little support from other astronomers; the phenomena observed in the atmospheres of Jupiter and Saturn testify to the existence of very powerful forces. Even on the earth such explosions as that of Krakatoa occur, in which cubic miles of matter are flung to a great height. Moreover, retrograde orbits would occur more readily if the motion of the parent planet were slower and its gravitation weaker, which would explain their restriction to the comet-families of Uranus and Neptune. Hence it would seem to be premature to accept the non-connection of Neptune with the comet-family that bears his name, as finally demonstrated.